REMARKS/ARGUMENTS

Favorable reconsideration of this application is respectfully requested.

Claims 1, 2, 4-5, 16-18, 27-30 and 35-38 are pending in this application. Claims 1 and 16 are amended and claims 6, 19, 31-34 and 39-42 are canceled by way of the present amendment.

Claims 1-2, 4-5, 16-18, 27-30 and 35-38 were rejected under 35 U.S.C. § 103(a) over Kuwahara (U.S. 5,444,271) in view of Roman et al. (U.S. 4,053,924).

The present invention relates to a contact section or a device where a position of the peak of an impurity concentration of a impurity layer or region formed in a surface of a substrate is more than 0.2 $\mu$m and less than 1 $\mu$m, and a position of the peak of an impurity concentration of a contact layer or region is 0.2 $\mu$m or less from this surface. The contact layer or region is thinner than the respective impurity layer or region. With this structure, both increase in the speed of the turn-off operation (i.e., reduction of the carrier injection coefficient) and reduction in the on-state resistance can be simultaneously realized. Generally speaking, if the impurity layer is made thinner, the on-state resistance decreases while the speed of turn-off decreases. Conversely, if the impurity layer is made thicker, the on-state resistance and the speed of turn-off increase. Accordingly, this structure or device was realized through detailed study by the inventors.

Turning now to the 35 U.S.C. §103 rejection, the Office Action again relies upon Kuwahara to teach an IGBT semiconductor device and correctly finds this reference to fail to teach a device having the second-conductivity-type impurity layer or region respectively recited in claims 1 and 16. The Office Action relies upon use of a thin region 34 in Roman et al. as a "general teaching." The Office Action goes on to assert that while Roman et al. was found to be silent with respect to a thickness of more than 0.2 $\mu$m and not more than 1.0 $\mu$m for layer 34, it would have been obvious to modify layer 34 to such a thickness since Roman

et al. teaches the "general condition of a claim" and discovery of "the optimum or working ranges involves only routine skill in the art" (see Office Action at pages 4-5).

First of all, the argument that Roman et al. teaches the "general conditions" of either of claims 1 or 16 is not well-founded. Roman et al. teaches that the thickness of region 32 is from between 300 and 800 Å and the thickness of recombination layer 34 is between 50 and 200 Å. As mentioned above, it is not a simple matter to change the thicknesses of layers since there are competing considerations as discussed above. Secondly, the contact layer and contact region of claims 1 and 16, respectively, are thinner than the respective impurity layer and impurity region. Roman et al. teaches that region 32 is thicker than layer 34, contrary to that recited in claims 1 and 16. This demonstrates that the argument that the "general conditions" of claims 1 and 16 are met is incorrect and, in fact, the teachings of Roman et al. are contrary to the section of claim 1 and the device of claim 16.

It has also not been established that the teachings of Roman et al. are actually applicable to the structure of Kuwahara. There is no suggestion that layer 11 of Kuwahara may be reduced in thickness from about 10 $\mu$m to the thickness of layer 34 (50-200 Å), or that region 32 could be substituted for layer 21. The rejection lacks sufficient evidence of a factual basis to combine the references at all, taking into consideration the teachings of Roman et al. Further, assuming the combination could be made (which the Applicants dispute), the Office Action lacks any evidence of motivation to further modify the combination to obtain the section and device recited in claims 1 and 16. As discussed above, there is no motivation to modify the thickness of layer 34 or that region 32 should be thinner than layer 34. The Office Action simply combines the structure in Kuwahara, which clearly does not suggest the claimed section and device, with another reference, whose layers are thinner but also does not suggest the claimed section and device. Such a combination clearly cannot suggest the claimed section and device.

Claims 1 and 16 recite positions of the peaks of the impurity concentrations of the contact layer and region and impurity layer and region, respectively, and that the contact layer and region are thinner than the impurity layer and region, respectively. These structures are clearly not suggested by the combination of Kuwahawa and Roman et al. It is therefore respectfully submitted that the present invention is patentably distinguishable over the applied prior art, and is therefore in condition for allowance.

Allowance of the present application is in order, and a favorable decision to that effect is respectfully requested.

Respectfully submitted,

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